FLAVONOIDS OF THE *Onobrychium* SECTION OF THE GENUS *Astragalus*

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On analyzing chromatographic information about the flavonoid compositions of 80 species of *Astragalus*, we directed our attention to the fact that the species of the *Onobrychium* Bunge section were distinguished from the others by the number and size of the spots on chromatograms in the 15% acetic acid and butan-1-ol–acetic acid–water (4:1:5) solvent systems.

We have continued [1] a study of the milk vetches of this section (*Astragalus sevangensis* Grossh., *A. circassicus* Grossh., *A. bungeanus* Boiss., *A. goktschaicus* Grossh., *A. interpositus* Boriss., and *A. arguricus* Bunge) for the presence of flavonoid compounds.

The epigeal part of each of the species was exhaustively extracted with 70% ethanol in an apparatus of the Soxhlet type. The ethanolic extracts were evaporated to aqueous residues and the latter were treated with chloroform. The purified aqueous residues were extracted with ethyl acetate, the extracts were evaporated, and the combined flavonoids were precipitated with dry chloroform and were separated on a column of polyamide sorbent. Six compounds (1-6) were isolated from each species and identified. A substance (VII) was isolated only from *A. circassicus* Grossh.

Substance (I) – astragalin (kaempferol 3-O-β-D-glucopyranoside), $C_{21}H_{20}O_{11}$, mp 177-179°C, $[\alpha]_D^{20}$, −69° (c 0.5; ethanol). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 362, 265 nm.

Substance (II) – isoquercitrin (quercetin 3-O-β-D-glucopyranoside), $C_{21}H_{20}O_{12}$, mp 238-240°C, $[\alpha]_D^{20}$ −69.2° (c 0.1; methanol). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 362, 255 nm.

Substance (III) – rutin (quercetin 3-O-rutinoside), $C_{27}H_{30}O_{16}$, mp 187-189°C, $[\alpha]_D^{20}$ −31.5° (c 0.32; dimethylformamide). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 362, 257 nm.

Substance (IV) – hyperoside (quercetin 3-O-β-D-galactopyranoside), $C_{21}H_{20}O_{12}$, mp 232-234°C, $[\alpha]_D^{20}$ −36.4° (c 1.08; formamide). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 361, 257 nm.

Substance (V) – quercitrin (quercetin 3-O-α-L-rhamnopyranoside), $C_{21}H_{20}O_{11}$, mp 183-185°C, $[\alpha]_D^{20}$ −22° (c 0.11; methanol). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 355, 257 nm.

Substance (VI) – trifolin (kaempferol 3-O-β-D-galactopyranoside), $C_{21}H_{20}O_{11}$, mp 228-230°C, $[\alpha]_D^{20}$ − 45.1° (c 0.14; methanol). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 355, 266 nm.

Substance (VII) – cynaroside (luteolin 7-O-β-D-glucopyranoside), $C_{21}H_{20}O_{11}$, mp 256-258°C, $[\alpha]_D^{20}$ −53° (c 0.57; methanol–pyridine (5:1)). UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 353, 257 nm.

The structures of all the compounds isolated were confirmed by the results of elementary analysis and of UV and IR spectroscopy and by a study of the products of acid and enzymatic hydrolysis, and also by comparison with authentic samples.

LITERATURE CITED

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